IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Title	Differential Energy Composites
Serial No.	10/582313
Confirmation No.	3997
First Named Inventor	James W. Cree
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Art Unit	4132
Examiner	Jeffrey A. Vonch
Docket No.	TRED54
Customer No.	53476

Declaration of Rick Seyler

1. I, Rick Seyler, make this Declaration in support of the patentability of US Patent Application No. 10/582313, filed May 16, 2007 and entitled Differential Energy Composites.

2. I am employed by Tredegar Film Products Corporation in Richmond, VA as a Research Associate. I have over 7 years of experience in the design and development of films and laminates using vacuum pressure differential. I consider myself to be one skilled in the art of such materials.

3. I have reviewed the above-referenced application, the Office Action mailed March 5, 2010, as well as the Curro, Benson, Ahr and Dobrin references cited by the Examiner and I am familiar with the contents of these materials.

4. As I understand it, the Examiner's position is that Curro teaches a composite containing a formed film bonded to a nonwoven web. The film can be a vacuum formed film as taught by Ahr, incorporated by reference into Curro. The nonwoven web has apertures to expose the film. The apertures are created according to the process of Benson, also incorporated by reference into Curro. The Benson process requires pre-weakening the nonwoven web at select locations, and then stretching the web to create apertures at the pre-weakened locations.

5. The Examiner admits that Curro/ Ahr/ Benson does not teach vacuum laminating the composite and further admits that the combination does not teach stretch activating the

composite. The Examiner relies on Dobrin for the teaching of making a composite by vacuum lamination and also relies on Dobrin for the teaching of stretch activating the composite. The Examiner concludes that it would have been obvious to make the Curro composite and then activation stretch the composite as taught by Dobrin.

6. The Benson reference is relied upon by the Examiner as a to provide the apertures in the nonwoven as a result of activation stretching. However, as noted, Benson requires a treatment step to pre-weaken the nonwoven web and an activation step to form the apertures. It is not clear from the Office Action with respect to the sequence of steps being asserted. In particular, it is not clear if the Examiner is suggesting that the treatment step to weaken the nonwoven should occur before or after lamination to the film. In other words, the treatment step of Benson could conceivably take place before the nonwoven is laminated to the film or after, but in any event before activation stretching. The Examiner's rejection does not articulate which of the two sequences is being applied in the rejection.

7. Benson teaches a process of making apertures in a nonwoven web by pre-weakening the nonwoven using an ultrasonic horn followed by intermeshing gear activation. *See* Figures 5-6 of Benson and the corresponding description. To first demonstrate that Benson provides an enabling disclosure in this respect, two control nonwoven webs were produced under my direction and control:

Sample 61: A bonded carded nonwoven web (SHEPPSH-16 from Shalag Shamir, basis weight of 16 gsm) was passed between an ultrasonic horn and an anvil roll. The nonwoven web was then passed through a nip formed between two intermeshing gear rollers to activation stretch the web.

Sample 62: A spunbonded nonwoven web (Softspan® 200 from Fiberweb, basis weight of 25 gsm) was passed between an ultrasonic horn and an anvil roll. The nonwoven web was then passed through a nip formed between two intermeshing gear rollers to activation stretch the web.

8. Samples of these webs are attached, as well as the corresponding optical micrographs (Exhibits A and B, respectfully). As can be seen from these webs and the micrographs, the Benson process was viable and produced apertures at the ultrasonic points for both nonwoven webs. The process yielded better results with the spunbonded nonwoven as compared to the carded nonwoven. In particular, the integrity of the spunbonded web

was better and the apertures produced were more predictable and uniform. With the carded web, the process was more destructive and the results less desirable and predictable. In fact, as seen with Exhibit B, several of the pre-weakened areas did not aperture, leaving small areas of fused fibers on the web, which is generally not desired in topsheets because it detracts from the tactile feel of the web and also diminishes the porosity of the nonwoven and interferes with fluid transfer.

9. Because of the drawbacks noted above, one skilled in the art would not be motivated to use a carded nonwoven web in the Benson process. Benson is directed toward producing apertures in a nonwoven web. It is logical for one skilled in the art to use a nonwoven web that produces the best results in that process and to avoid using a web that produces a less uniform and less desirable outcome. Moreover, Benson teaches a process in which the nonwoven is first pre-weakened such that the frequency and position of the apertures can be determined in advance of actually forming the apertures. Those objectives are not achieved when using a bonded carded nonwoven.

10. To demonstrate the differences, if any, between the teachings of Curro to aperture the nonwoven web prior to lamination and the modification proposed by the Examiner of aperturing the nonwoven after lamination, a series of composites were prepared under my direction and control as follows:

Sample 70: A bonded carded nonwoven web with a basis weight of 16 grams/m^2 ("gsm") (SHEPPSH-16 from Shalag Shamir) was passed between an ultrasonic horn and an anvil roll to pre-weaken the nonwoven. The pre-weakened nonwoven was then used in a vacuum lamination process to create a vacuum formed and vacuum laminated composite. The composite was then passed through a nip formed between two intermeshing gear rollers to activation stretch the composite.

Sample 71: A bonded carded nonwoven web with a basis weight of 25 gsm (Sofspan® from Fiberweb) was passed between an ultrasonic horn and an anvil roll to pre-weaken the nonwoven. The pre-weakened nonwoven was then used in a vacuum lamination process to create a vacuum formed and vacuum laminated composite. The composite was then passed through a nip formed between two intermeshing gear rollers to activation stretch the composite.

Sample 72: The nonwoven from Sample 61 was used in a vacuum lamination process to create a vacuum formed and vacuum laminated composite.

Sample 73: The nonwoven from Sample 62 was used in a vacuum lamination process to create a vacuum formed and vacuum laminated composite.

Sample 84: A bonded carded nonwoven web having a basis weight of 16 gsm (SHEPPSH-16 from Shalag Shamir) was used in a vacuum lamination process to create a vacuum formed and vacuum laminated composite. The composite was then passed between an ultrasonic horn and an anvil roll. The composite was then passed through a nip formed between two intermeshing gear rollers to activation stretch the composite.

Sample 85: A bonded carded nonwoven web having a basis weight of 25 gsm (Softspan® 200 from Fiberweb) was used in a vacuum lamination process to create a vacuum formed and vacuum laminated composite. The composite was then passed between an ultrasonic horn and an anvil roll. The composite was then passed through a nip formed between two intermeshing gear rollers to activation stretch the composite.

11. These samples are attached hereto and optical micrograph images of these samples are enclosed as Exhibit C-H, respectively.

12. The observations and learning revealed from an examination of the Samples and Exhibits are summarized in Table 1 below. The data from Table 1 demonstrate that the modifications of Curro's teachings proposed by the Examiner are not viable to produce the Curro laminates. In particular, laminating the nonwoven to the film, and then trying to aperture the nonwoven does not result in the product that is desired by Curro, regardless of whether the nonwoven is pre-weakened before lamination or afterward. Because the product is materially different than the one of Curro, the modification cannot be considered an obvious modification.

13. An examination of these samples reveals that when the nonwoven was first apertured and then laminated (Samples 72 and 73) the objectives of Curro were obtained. By contrast, pre-weakening the nonwoven, laminating, then stretching (Samples 70 and 71) did not result in a Curro style laminate. Similarly, laminating, pre-weakening the nonwoven, and then stretching the laminate (Samples 84 and 85) also failed to yield a Curro style laminate. These results demonstrate that modifying the process sequence from that taught by the Curro/ Benson combination yields a materially different product. As such, the modification would not be considered obvious to one skilled in the art because a different result is obtained.

14. Based on the above, I submit that it would not have been obvious to activation stretch the laminate of Curro/ Benson after lamination because such a modification would not have resulted in the structure taught and desired by Curro. Nor would such a process have resulted in the apertured nonwoven taught and desired by Benson.

TABLE 1

Sample/ Exhibit	Comments/ observations
Sample 70/ Exhibit C	• The pre-weakened areas in the nonwoven web failed to yield apertures • The laminate of Curro was not obtained in this sample
Sample 71/ Exhibit D	• The pre-weakened areas in the nonwoven, once laminated to the film and activated, resulted in the formation of holes that went through both the nonwoven and the film layers • The laminate of Curro was not obtained in this sample.
Sample 72/ Exhibit E	• The laminate of Curro is obtained in this sample • The Curro laminates are obtained even if the adhesive lamination of Curro is replaced with vacuum lamination • These laminates were significantly stiffer, have less drape, are less soft, less cross-direction extensibility and generally have less desirable tactile properties as compared to Sample 70 and 84
Sample 73/ Exhibit F	• The laminate of Curro is obtained in this sample • The teachings of Curro are obtained even if the adhesive lamination of Curro is replaced with vacuum lamination • These laminates were significantly stiffer, have less drape, are less soft, have less cross-direction extensibility, and generally have less desirable tactile properties as compared to Sample 71 or Sample 85
Sample 84/ Exhibit G	• Areas of fused fibers in the nonwoven corresponding to the pre-weakened areas which either failed to aperture or created holes in the composite • Apertures were not created in the nonwoven to expose an underlying film surface • The composite of Curro was not obtained in this sample
Sample 85/ Exhibit H	• Areas of fused fibers in the nonwoven corresponding to the pre-weakened areas which either failed to aperture or created holes in the composite • Apertures were not created in the nonwoven to expose an underlying film surface • The laminate of Curro was not obtained in this sample.

15. I can find no teaching or guidance in any of the Curro, Benson, Ahr or Dobrin references that would motivate the skilled artisan to deviate from the teachings of Curro and laminate the nonwoven to the film before creating the apertures in the nonwoven web. As noted above, the results are significantly different from what was desired by Curro.

16. Regardless of what other factors may have otherwise motivated the skilled artisan to activate the materials after lamination as opposed to before lamination, the failure to obtain the desired product would have been the overriding concern in modifying the teachings of the Curro reference in light of Benson. Instead of basing the proposed modification and the rejection on the teachings of the references, it appears that the Examiner's position is based on hindsight reconstruction of the invention using the pending application as the teaching reference.

17. As I understand the specification, the term "recesses" is used to identify areas in the nonwoven web that have been disturbed or disrupted such that fluid access to the underlying film is improved. In this context, the "recess" provides a point in the nonwoven where fluid access to the film is improved or enhanced. Stated differently, the term "recess" indicates an area where the film is more exposed to fluids through the nonwoven as compared to other areas of the nonwoven.

18. A number of methods of making the "recesses" are disclosed in the specification. In some of those methods, the fibers of the nonwoven are eliminated completely, whereby the composite in such areas presents only one material to the fluid – namely the underlying film because the nonwoven has simply ceased to exist in that apertured area. This is what all the prior art have in common, they all produce "holes" in the nonwoven of defined shape, size and placement which eliminate the nonwoven fibers in those apertured areas.

19. The claims under consideration by the Examiner, however, are limited to a particular embodiment of making the recess areas by using a pair of intermeshing gear (IMG) rollers. A nonwoven is a collection of fibers generally randomly laid and bonded together to form a cohesive web. The arrangement of fibers in the nonwoven creates pores that have a particular size distribution for any given web. When the fibrous nonwoven web is bonded to the film and then stretched using the IMG rollers, the pore

size distribution changes and shifts because the IMG rollers disrupt the fibers to spread them out, but only in select areas of the web. Thus, the bell curve defining the pore size distribution in the web shifts to the right because larger pores are being created. There is also a change in the shape of the curve as a higher proportion of the pores are now larger.

20. Unlike the prior art, however, creating recesses using the IMG activation process does not necessarily eliminate any fibers – it simply spreads them out. With activation stretching using intermeshing gear rollers as specified in the claims, there are no apertures *per se*, but rather areas where the intermeshing teeth on the rollers cause the fibers to separate in select areas, thus giving fluids better access to the film through larger pores in the nonwoven. These recesses or access points would thus be less structured, less uniform and more randomly formed as opposed to a the aperturing processes used in the prior art. With prior art processes, the pore size distribution in the nonwoven would show the addition of a large spike to account for the presence of a significant number of holes, all of approximately equal size. The remainder of the curve would be relatively the same.

21. When using the IMG process, fluids will still contact the fibers of the nonwoven web as a primary contact surface in the composite, which allows for a true energy gradient because the fluid is contacting a first material before it contacts the second material. In the prior art, the nonwoven has been eliminated in the apertured area, leaving only the film layer. With only a single film layer, the fluids experience no true gradient in moving through the composite in the apertured areas because they contact only a single material. Therefore, the creation of recesses or access points using IMG produces a composite that is both structurally and functionally different from the composites used in the prior art. These differences are not taught by the prior art, are not suggested by the prior art and it would not be obvious to one skilled in the art to make a composite having these features based on the teachings from the prior art of record.

22. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18

of the United States Code and that such willful false statements may jeopardize the validity of the application of any patent issued thereon.

Respectfully submitted,

Rickey J Seyler

Dated: 9/28/10